

Wild Rice Standards Study Advisory Committee

June 11, 2013, MPCA St. Paul Offices

Meeting Summary

Advisory Committee attendees: Joe Mayasich, Kurt Anderson, Sara Barsel, Paula Maccabee, Nancy Schuldt, Darren Vogt, Ann Geisen, Raymie Porter, John Dockter, Kathryn Hoffman, Anne Nelson, Robin Richards, Bethel and Len Anderson, David Hatchett, Mike Robertson, David Smiga, Peder Larson (for David Smiga), Bob Shimek, Steve Nyhus

Others: Mike Hansel, Lloyd Grooms, Lori Andresen, Bob and Pat Tammen, Adam Lozeau

MPCA staff: Patricia Engelking, Shannon Lotthammer, Mark Tomasek, Ed Swain, Gerald Blaha, Phil Monson, Eric Alms

Agenda Item 1: Introductions and Meeting Goals

Shannon Lotthammer provided a review of the advisory committee purpose and meeting goals.

Agenda Item 2: Advisory Committee Updates

Nancy Schuldt announced that the Fond du Lac Band of Lake Superior Chippewa has received a National Environmental Information Exchange Network grant from EPA to develop a regional wild rice database. The three-year effort will begin this fall.

Paula Maccabee asked about the comments Water Legacy has submitted about the draft assessment process on the web. Mark Tomasek noted that the assessment process and comments would be discussed later in the meeting.

Agenda Item 3: Study Updates

- **Sediment incubation studies**—Ed Swain described the sediment incubation experiments that Nate Johnson is working on in his laboratory at UMD. The study is designed to explore whether sulfate in the overlying water penetrates into the sediment at winter and spring temperatures and if it is converted to sulfide. Sediment samples for this project were collected from two locations—the Partridge River north of Highway 110 above the confluence with Second Creek, and North Bay in the St. Louis River just west of Boy Scout Landing. The organic content of the two sites is different with the sediment from the St. Louis site having approximately ½ the organic content of sediment from the Partridge River site. The sediment incubation experiments are being conducted in triplicate at two different temperatures, with appropriate controls.
- **Field Survey**—Ed Swain described the planned sampling for 2013, indicating that the MPCA is now planning to sample 15 sites intensively three times during 2013 in June, July and August. An additional 10-20 sites will be sampled once in late summer/early fall. Ed noted that many of the sites sampled over the past two years are waters with low sulfate concentrations that successfully grow wild rice. Sampling this year will focus on obtaining data from higher sulfate systems that may or may not grow rice. The sampling will focus primarily on two areas where elevated sulfate has been observed/measured— the western and southwestern boundaries of wild rice in Minnesota and portions of the Iron Range.

At two sites, Sandy Lake and Second Creek, porewater equilibrators (peepers) will also be deployed at least three times during the season to supplement the field water, sediment, and porewater sampling and analysis. The peepers will provide a profile of porewater chemistry at different depths in the sediment.

- Advisory committee members had questions about which species of wild rice, *Zizania palustris* or *Zizania aquatica*, was present at the site at the Turtle River site in North Dakota. Ed Swain noted that

although the growth form looks different at the site in North Dakota, the wild rice seeds from this location were keyed out to be *Zizania palustris*.

- It was also suggested that the MPCA consider adding sites 32 (Padua Lake) and 36 (Raymond Lake) to the group of intensive sites. Raymond Lake had a successful wild rice restoration and Padua Lake did not. Another advisory committee member asked about Padua Lake, the site with unsuccessful restoration of wild rice. She suggested the MPCA try to learn why the wild rice restoration was unsuccessful as there could be many human impacts (ditching, tiling, irrigation, etc.) in this area of the state that could have affected the wild rice.
- Another committee member noted that the Geneva Lake sites had not had rice since the 1950s with the exception of one piece of one plant observed in 2002. It was noted that the land use in that area is heavily agricultural with extensive ditching and tiling.
- An advisory committee member asked if phytoliths would be measured in any of the sediment samples, and if the phytolith analysis could provide any sense of the abundance of wild rice as opposed to just indicating presence or absence. Ed Swain noted that there is budget to analyze 30 sites for *Zizania*-specific phytolith concentration in the sediment, which may be proportional to past wild rice abundance. Additional data collection may be collected during the 2013 field season to test the proportionality.
- Another advisory committee member suggested that the field crew be encouraged to take more extensive field notes. Ed noted that additional instructions about field notes has been provided to the field crew based on earlier Advisory Committee comments.

University of Minnesota-Duluth mesocosms (container experiments in 378 liter stock tanks)—Ed Swain described the work that is underway at the UMD Research and Field Studies Station to determine responses of wild rice to a range of sulfate concentrations. The MPCA will be building on an experiment focusing on wild rice response to a range of sulfate concentrations that was begun in 2011. The experimental design uses a total of 30 polyethylene stock tanks (378 liter) divided into six replicate tanks per treatment with five treatment levels (control plus four sulfate levels). The four sulfate levels are 50, 100, 150 and 300 mg SO₄/Liter.

Dr. Johnson will also be deploying two porewater equilibrators, known as peepers, in each of four tanks approximately monthly during the 2013 growing season. The purpose of the deployment is twofold: 1) to assess the porewater chemistry in each sulfate treatment over the growing season, and 2) to assess the ability of wild rice to release oxygen from the roots that decreases the concentration of sulfide in the porewater. The first task is assessed by deploying a peeper adjacent to growing wild rice plants. The second task is assessed by deploying a second peeper in the same tank in one end of the tank where plants have been purposefully not allowed to grow. In 2013 a Plexiglas vertical divider has been installed near one end of each tank, isolating about 10% of the container. No plants will be allowed to grow in that 10%, so that the effect of plants can be assessed. The Plexiglas divider extends only a few cm above the sediment, so that the overlying water is the same over each part of the tank. A diagram of the mesocosm tanks (not to scale) was put on the white board in the meeting room to indicate the placement of the divider, peepers, and stand pipe that each tank has to maintain water level.

Advisory Committee members had several suggestions and requests for more information about the experiment design and mesocosm methods.

- Questions were raised about the procedure to thin the wild rice plants in each mesocosm. An advisory committee member suggested that researchers try to minimize technician variation in the thinning process.

- Advisory committee members expressed a desire for more detail on the type and frequency of analyses at the mesocosms—what will be analyzed daily, weekly, monthly?
- One member suggested these experiments would usually be termed “microcosms” vs. “mesocosms.”
- Advisory committee members asked if more than 5 plants could be selected for additional analysis. An advisory committee member asked for a description of the statistics relating to choosing the number of subsamples (5 out of 30).
- A suggestion was made to harvest the entire biomass of mesocosm experiments and to consider additional analyses on the harvested biomass at the end of the season. MPCA staff noted that the current draft SOP indicates that all the biomass above the sediment is harvested and weighed, and a subsample taken for further analysis.
- Suggestion that Dr. Myrbo’s team retain seeds from wild rice plants at time of last sampling.
- Consider genetic analysis to ensure that inbreeding of wild rice has not taken place over time at the mesocosm site by comparing genetics of mesocosms to genetics of lakes.
- Advisory Committee members would like to see the levels of sulfate in the tanks prior to and after dosing with sulfate this year.
- Suggestion that placement of peepers in the mesocosms should follow a randomized procedure.

• **Hydroponics experiments**—Phil Monson reported on the status of the hydroponics experiments. Researchers have completed range finders for the sulfate germination and sulfate juvenile seedlings tests and are working on method development for the sulfide experiments. Final methods for the sulfate hydroponic experiments will be shared with the advisory committee before “definitive tests” are undertaken –the same will be true for the sulfide methods.

- § An advisory committee member commented that the juvenile seedling experiments would not have enough growth to be considered “floating leaf” stage. Members also reiterated the importance of documenting the definitions of the terminology used to describe various stages of plant growth.

Agenda Item 4: Assessment Process

Mark Tomasek reported on comments received on the draft assessment method for the wild rice sulfate standard and provided an update and timeline for the assessment process. The MPCA received comments from Water Legacy, the 1854 Treaty Authority, Minnesota Audubon and the Minnesota Chamber of Commerce on the draft assessment method. The MPCA has posted these comments on the wild rice web site and has made some changes to the assessment method based on the comments received. The comments and updated method can be found on the MPCA’s wild rice web page under the assessment link (method development section: <http://www.pca.state.mn.us/ktqh1083>). Mark noted the assessment methods will continue to be revised as the agency moves through the assessment process, so that any refinements to the method that are made as the data are analyzed are fully documented. The data are currently undergoing quality assurance and quality control procedures and the assessment process, including professional judgment meetings, will take place in the summer and early fall. The draft impaired waters list will be put on public notice in the fall of 2013. At the time of public notice, there will be a formal public comment period.

Anyone who is interested in the impaired waters list can sign up on the MPCA’s GovDelivery list that focuses on this topic. Please use the link below for the GovDelivery signup. It is a general signup. Anyone interested in the impaired waters list should click the EMAIL ALERTS link in the upper right corner of the page, provide their email address, click next and select TMDL (303d) Impaired Waters List. Other GovDelivery selections can be made here, as well.

GovDelivery Signup for the Impaired Waters List - <http://www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesotas-impaired-waters-and-tmdls/impaired-waters-list.html>

Follow-up Items: Advisory committee members requested a copy of the 2012 assessment guidance document. This guidance document will be revised for the 2014 Impaired Waters List. This guidance document will include the methods for wild rice assessment.

Link to 2012 assessment guidance: <http://www.pca.state.mn.us/index.php/view-document.html?gid=16988>

Agenda Item 5: Next Steps

1. MPCA will get back to the Advisory Committee on changes made to the SOPs and site selection based on their specific suggestions and questions.
2. Final methods for sulfate germination and juvenile seedling methods will be completed and circulated. Draft methods for sulfide germination and juvenile seedling methods will be shared when available.
3. Another meeting will be planned for Duluth in August (to be completed before ricing season opens.)